

Updating Maricopa Association of Governments Specification Section 738 to Current ASTM F894

Corey A. Park, PG
Rocky Mountain Territory
Weholite Sales Solutions

May 21, 2019

Agenda



- **Weholite Introduction**
- **Overview of Section 738 Areas to Update**
- **Weholite Application Details**

Weholite Introduction

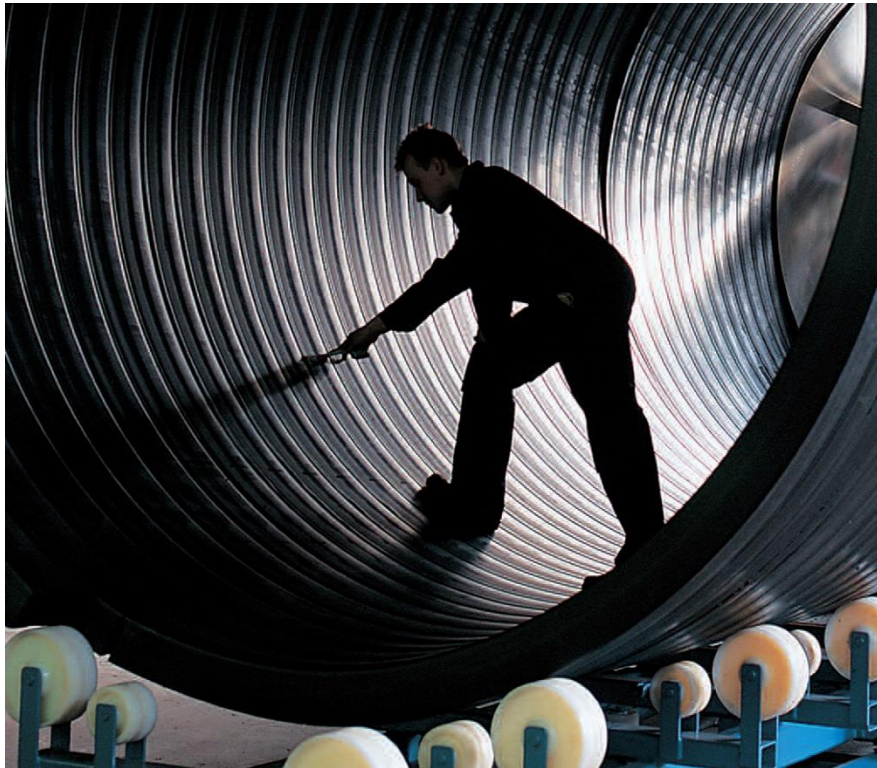
- High Density Polyethylene (HDPE) Structural Profile-Wall Construction
- Diameters from 18 to 132 inches
- Operating pressures to 30 psi
- Burial Depth of 2' – 35'
- Manufactured to ASTM F894*
- NSF Third Party Certification
- Manufacturing Facilities are ISO 9001-2015 Certified
- Infinitely Customizable



* ASTM F894-19 Standard Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe

Weholite Values

Values = Long Service Life

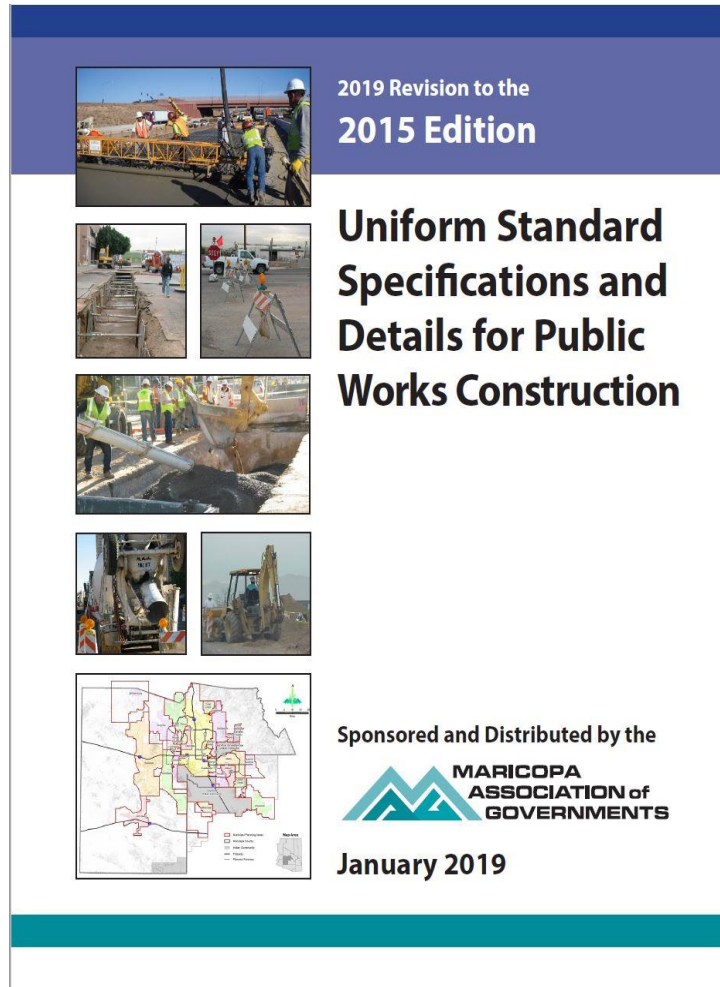


- **100-year+ Service Life**
- **Corrosion and Chemical Resistant**
- **Abrasion Resistant**
- **Superior Flow Characteristics**
- **Leak and Infiltration Free Joints**



Weholite Solutions

MAG SPECIFICATION 738 UPDATES



2019 Revision to the
2015 Edition

Uniform Standard
Specifications and
Details for Public
Works Construction

Sponsored and Distributed by the
**MARICOPA
ASSOCIATION of
GOVERNMENTS**

January 2019

- **738.1 General**
 - **Allowable diameter**
 - **Applications**
 - **Joint Testing**
- **738.2.1 Materials**
 - **Base Material Composition**
- **738.3.2 Thermal Weld Type**
 - **Remove limitation on welded joints**
- **738.5 Certification**
 - **Require certifications to manufacturing requirements**
- **738.7 Classification**
 - **Allowable Ring Stiffness Constant (RSC) classifications**

Current 738.1 Specification

738.1 GENERAL:

This specification covers the requirements of profile-reinforced and corrugated (Type S or Type D) high density polyethylene (HDPE) pipe manufactured per ASTM [F894](#), AASHTO M-252 or AASHTO M-294 for gravity flow, low pressure storm drain and sanitary sewer systems. When noted on the plans or in the special provisions, gravity flow, low pressure storm drains and sanitary sewers may be constructed using HDPE pipe. The HDPE pipe will be of the sizes 8-inch diameter through 120-inch diameter. For the purpose of this specification, low pressure is defined as the test pressures of 3.5 psi of air or 4 feet of water as specified in Section [615.11](#).

All pipe joints shall conform to the controlled pressure test of 10.8 psi of air or 25 feet of water as stipulated in ASTM [D3212](#).

The size and class of the HDPE pipe to be furnished shall be designed by the Engineer and shown on the plans or in the project specifications. At no time will the class designed be less than RSC-63 for profile pipe, or minimum equivalent Pipe Stiffness (PS) for corrugated pipe per the requirements of AASHTO M-252 or AASHTO M-294.

Proposed 738.1 Specification Revision

738.1 GENERAL:

This specification covers the requirements of profile-reinforced HDPE pipe manufactured per ASTM F894 and corrugated (Type S or Type D) high density polyethylene (HDPE) pipe manufactured per AASHTO M-252 or AASHTO M-294 for gravity flow, low pressure storm drain systems, sanitary sewer systems, **and irrigation systems**. When noted on the plans or in the special provisions, gravity flow, low pressure storm drains and sanitary sewers **and irrigation systems** may be constructed using HDPE pipe. **The HDPE pipe will be of the sizes 8-inch diameter through 132-inch diameter***. For the purpose of this specification, low pressure is defined as 50-feet of water column or less. ~~the test pressures of 3.5 psi of air or 4 feet of water as specified in Section 615.11.~~

All pipe joints shall be qualified in accordance with ASTM D3212 (i.e. shall be tested at a pressure of 10.8 psi of air or 25 feet of water **and a vacuum of 74kPA[^]** as stipulated in ASTM D3212.)

The size and class of the HDPE pipe to be furnished shall be designed by the Engineer and shown on the plans or in the project specifications. At no time will the class designed be less than RSC-63 for profile pipe or minimum equivalent Pipe Stiffness (PS) for corrugated pipe per the requirements of AASHTO M-252 or AASHTO M-294.

*-ASTM F894 Section 1.1

[^]-ASTM D3212 Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals

Current 738.2.1 Specification

738.2.1 Base Material Composition:

Profile pipe base material and fittings shall, in accordance with ASTM F894, be made from a PE plastic compound meeting the requirements of Type III, Class C, Category 5, Grade P34 as defined in ASTM D1248 and with established hydrostatic design basis (HDB) of not less than 1250 psi for water at 73.4 degrees F° as determined in accordance with Method ASTM D2837. Materials meeting the requirements of cell classification PE 334433 C or higher cell classification, in accordance with ASTM D3350 are also suitable. Corrugated pipe base material shall comply with the requirements of AASHTO M-252 (Type S) or AASHTO M-294 (Type S or D) and have a minimum cell classification PE 335420C.

Proposed 738.2.1 Specification Revision

738.2.1 Base Material Composition:

Profile pipe base material and fittings shall, in accordance with ASTM F894, be made from a PE plastic compound **meeting the requirements cell classification PE334433C or higher in accordance with ASTM D3350[#]**. Corrugated pipe base material shall comply with the requirements of AASHTO M-252 (Type S) or AASHTO M-294 (Type S or D) and have a minimum cell classification PE 335420C.

- ASTM F894 Section 5.1 Base Materials

Current 738.3.2 Specification

738.3.2 Thermal Weld Type:

The pipe ends shall consist of an integrally formed bell and spigot, with or without the elastomeric centering gasket, which join together to form an interface between bell and spigot, such that it is suitable to seal by thermal weld using the extrusion welding process, in accordance with the manufacturer's recommended procedure.

Thermal welded joints may be effected by welding from inside the pipe or outside, or both.

The assembly of the welded joints shall be in accordance with the manufacturer's recommendations.

Thermal welded joints shall be used only when specified on plans or in specifications.

Proposed 738.3.2 Specification Revision

738.3.2 Thermal Weld Type:

The pipe ends shall consist either of an integrally formed bell and spigot, or plain end pipe. Pipe with a bell and spigot shall be furnished with or without the elastomeric centering gasket, which join together to form an interface between bell and spigot, such that it is suitable to seal by thermal weld using the extrusion welding process, in accordance with the manufacturer's recommended procedure.

Thermal welded joints may be effected by welding from inside the pipe or outside, or both.

The assembly of the welded joints shall be in accordance with the manufacturer's recommendations.

~~Thermal welded joints shall be used only when specified on plans or in specifications.~~

Current 738.5 Specification and Proposed Revision

738.5 Certification:

The manufacturer shall furnish an affidavit (certification) that all materials delivered shall comply with the requirements of ASTM F894 or AASHTO M-252.

Pipe and resin producers that manufacture according to AASHTO M-294 shall be certified according to the Plastic Pipe Institute protocol for their Third Party Certification Program.

738.5 Certification:

The manufacturer shall furnish an affidavit (certification) and **supportive testing documentation** that all materials delivered shall comply with the requirements of ASTM F894 or AASHTO M-252.

Pipe and resin producers that manufacture according to **ASTM F894** and AASHTO M-294 shall be certified according to the **Plastic Pipe Institute protocol** for their Third Party Certification Program.

Current 738.7 Specification

738.7 Classifications:

HDPE profile-reinforced pipe products shall be made in four standard Ring Stiffness Constant (RSC) classifications, 40, 63, 100 and 160. These are referred to as RSC-40, RSC-63, RSC-100 and RSC-160. The RSC test shall be conducted in accordance with ASTM D2412 with the exceptions listed in accordance with ASTM F894. HDPE corrugated pipe (Type S or Type D) shall meet the minimum Pipe Stiffness (PS) requirements of AASHTO M-252 or AASHTO M-294. The PS test shall be conducted in accordance with ASTM D2412 with the exceptions listed in accordance with AASHTO M-252 or AASHTO M-294.

Proposed 738.7 Specification Revision

738.7 Classifications:

HDPE profile-reinforced pipe products shall be made in **six** standard Ring Stiffness Constant (RSC) classifications, 40, 63, 100, 160, **250 and 400**. These are referred to as RSC-40, RSC-63, RSC-100, RSC-160, **RSC-250 and RSC-400***. The RSC test shall be conducted in accordance with ASTM D2412 with the exceptions listed in accordance with ASTM F894.

HDPE corrugated pipe (Type S or Type D) shall meet the minimum Pipe Stiffness (PS) requirements of AASHTO M-252 or AASHTO M-294. The PS test shall be conducted in accordance with ASTM D2412 with the exceptions listed in accordance with AASHTO M-252 or AASHTO M-294.

*-ASTM F894 Section 4.2 Classifications

Irrigation Applications

- Large Diameter
- Ease of Installation
- Corrosion Resistant
- Leak Free Joints
- 100+ Year Design Life





South Alamo Canal; Imperial Valley, CA 120-inch Inverted Syphon; 2000



10,850 linear-feet Of 72-inch Weholite installed to enclose
Saint Mary River Irrigation District open earthen canal
Alberta, Canada



Tumalo (Oregon) Irrigation District installation of miles of 72-inch to 132-inch diameter Weholite to reduce maintenance costs, public safety concerns, and evaporation of water since 2008

East Fork Irrigation District Oregon

- 4,800 linear-feet of 72-inch diameter Weholite installed
- Eliminated evaporation and infiltration through leak proof joints
- Improved public safety with ditch enclosure
- Light weight of pipe improved access and construction concerns



Thank you!

